International Journal of Innovative Technology and Exploring Engineering (IJITEE)
ISSN: 2278-3075 (Online), Volume-12 Issue-7, June 2023

Total Quality Management in Higher Technical Education

RS Mishra, Anshuman Pandey, Aryan Rana, Aakash Mehta

Abstract: ***The paper examines the behaviour of Indian Technical Education through Total Quality Management tools and techniques. To identify research gaps, we review existing research papers and propose solutions through an analytical data analysis process, with a significant focus on higher educational institutions. We will review the methodology currently used by universities and explore how it can be brought up to par with that of foreign universities. The reviewed papers will be used to identify the shortcomings of the research and will be taken into consideration when analysing it. Then we will be doing the quantitative data analysis of some collected data from google form and internet sources regarding the six TQM factors that influence the enrolment and hence the quality of institutions and determining the hypothesis result, then we will discuss the results and shortcomings of the analysis and will bridge those shortcomings by providing various possible solutions in that regards. Throughout the process, we have gathered data, analysed it, and provided a solution. We have used IBM SPSS AND AMOS software to construct TQM models and their covariance relations. The future aspect of this paper confirms that any industry can adopt the same procedure to analyse the quality of that organisation.***

Index Terms: Total Quality Management, Technical Institutions, AMOS & SPSS.

I. INTRODUCTION

"Quality" is a relative term, a multifaceted concept that depends on the viewpoints of both the consumer and the supplier. Usability (from a user-based perspective), requirement compliance (from a manufacturer-based perspective), gradation of preference (from a value-based perspective), and gradation of excellence (from an excellence-based perspective) are all ways that quality may be communicated (transcendental approach). The level of a product's ability to conform to design requirements is referred to as its conformance quality. [1-6]

Manuscript received on 11 May 2023 | Revised Manuscript received on 24 May 2023 | Manuscript Accepted on 15 June 2023 | Manuscript published on 30 June 2023.
*Correspondence Author(s)
Prof. RS Mishra, Department of Mechanical Engineering, Delhi Technological University, Delhi, India. E-mail rsmishra@dce.ac.in
Anshuman Pandey*, Department of Mechanical Engineering, Delhi Technological University, Delhi, India. E-mail anshumanp571@gmail.com, ORCID ID: 0009-0000-7977-4962
Aryan Rana, Department of Mechanical Engineering, Delhi Technological University, Delhi, India. E-mail aryanrana036@gmail.com
Aakash Mehta, Department of Mechanical Engineering, Delhi Technological University, Delhi, India. E-mail aakashmehta880@gmail.com

A. Quality in terms of the educational system

A good education provides all students with the assistance they require to lead economically productive lives, contribute to sustainable societies, and enhance individual well-being, thereby promoting peace and democracy. Quality in education can provide the desired knowledge and understanding in a respective field. Learning outcomes vary according to different objectives or goals which can be classified under TQM goals, but in the end, basic education must include initial levels of literacy, basic science knowledge and life skills learning, including all basic required trainings [7-9]. Moreover, other stakeholders in education, such as teacher quality, should be improved.

B. Education Scenario in India

India is a country that holds a good rank in the global education industry. India is also home to many foreign international students, with more than 260 million students, 760 universities, and 35,537 colleges. India has one of the most advanced educational systems in the world. But there is still a scope of growth in and around by implementing new policies [10]. However, the projected good growth ahead, which has been evident in recent years, will enable India to become the world's largest industry by expanding its ties and network worldwide.[11]

C. Primary Education

Lower elementary (Class I–V) and Upper Primary (Middle School, Class VI–VIII) are the two divisions of elementary education in India. For children between the ages of 6 and 14, the Indian government places a strong emphasis on primary education (Classes I–VIII), often referred to as elementary education. The elementary school visits vary between Indian states since the governments determine education rules [12]. To prevent children from working in hazardous settings, the Indian government has officially outlawed child employment. Due to social injustice and economic inequality, it is challenging to implement both the right to free education and the prohibition on child labour. At the primary level, 80% of all certified schools are managed or sponsored by the government, making it the biggest sector.

II. SECONDARY EDUCATION

Secondary education encompasses children aged 14 to 18, a group comprising millions of students. The last two years of secondary school are often referred to as Higher Secondary (HS) or Senior Secondary.

The two stages of secondary education are each an essential stage for which a passing certificate is required; hence, they are affiliated with boards of education under the Ministry of Education. Before pursuing higher education, including college or professional courses, one must complete these stages. [13]

III. HIGHER TECHNICAL EDUCATION

From the early five-year plan, India's focus was on developing a pool of scientific and technologically inclined personnel. India's National Policy on Education (NPE) includes a provision for an apex body to regulate and establish higher technical education, which was established as the AICTE in 1987 through an act of the Indian Parliament. At the central level, the Indian Institute of Technology, the Indian Institute of Space Science and Technology, the National Institute of Technology, and the IIIT are deemed institutions of national importance. According to one study, 75% of technical graduates and more than 85% of general graduates lack the skills needed in India's most demanding and high-growth global industries, such as Information Technology[14]. The government has made considerable efforts to uplift higher technical education. Therefore, it is essential to determine if the goals set by the GOI can be achieved. The method of Total Quality Management can link the goal of TQM with the Critical Success Factor, and, based on hypothesis testing, we can determine if the desired model can be used to infer the actual implications from the collected data.

A. Need for the Research

Essentially, our review work in the thesis reveals that numerous researchers have contributed to the field of higher education quality management, conducting qualitative analyses that utilise country and ministry information. Thus, they lack the quantitative part of the study. We have collected data from different universities(technical) and have done the quantitative analysis on the same.

IV. METHODOLOGY

A. Conceptual Development and Research Variables

The use of mediation analysis as a tool for determining the causal pathway(s) that connect an independent variable and a dependent variable through an intermediary variable has become increasingly common. Yet, when the intermediate variables (mediators) are high-dimensional, cross-functional, and the result is a survival endpoint, there has been very little research done in this area. This work makes an effort to model [15,16]. a complicated structure of a TQM system and link the critical success factors with the performance of the system to provide credible evidence for the hypotheses of interest. This questionnaire has been developed for research to carry out a survey and gather data for the goal of analysing the impact of CSFs on the performance of TQM using AMOS 22 software.

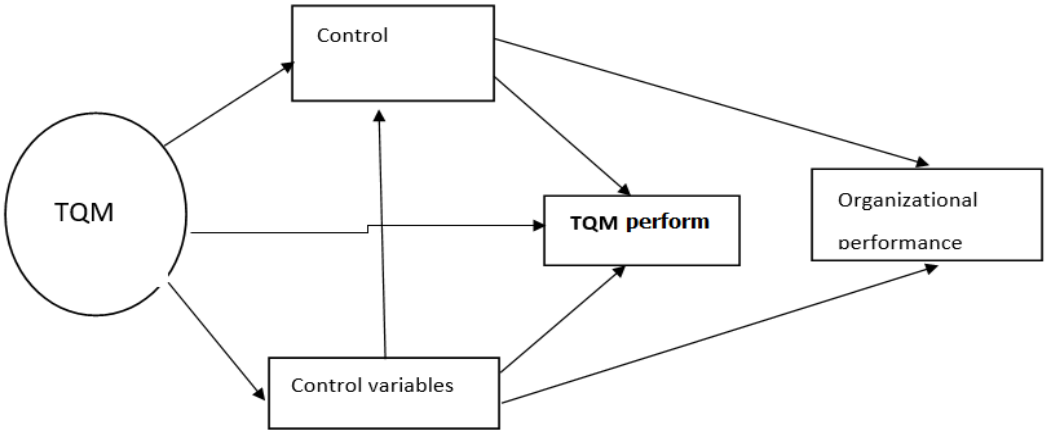


Fig. 1- The basic usage of structural equation modelling (SEM) in path analysis with mediation

The survey was administered to 250 students attending various educational institutions in India. A total of 150 people responded, and out of those 150 replies, 20 were eliminated because their answers were insufficient. As a result, the total number of participants in the sample for this study is 130, with a response rate of 52%. Both primary data (quantitative) and secondary data (data obtained from existing sources, such as books, papers, websites, reports, and journals) were gathered. The primary data were collected using a targeted questionnaire consisting of structurally designed questions. The secondary data was found to be a rapid, readily accessible, and low-cost method for gathering data that could be used to characterise the issue further. According to the findings of the reliability examination of the questionnaire as a whole, the Cronbach's value is 0.891, which is very close to 0.9, indicating that the questionnaire has a high degree of reliability.

If the value is more than 0.8, then the reliability of the questionnaire is excellent. If the value is between 0.8 and 0.9, then the reliability of the questionnaire is good. Generally, people consider that a questionnaire's reliability must be better than 0.5 to be considered rational. At the same interval of time, the calculated Cronbach's alpha magnitude of each influential component is greater than 0.6, indicating that the credibility and dependability of each influential factor are also improving.

Published By:
Blue Eyes Intelligence Engineering
and Sciences Publication (BEIESP)

The purpose of this study is to establish connections between many distinct categories of data. Data on TQM performance at three engineering institutions in India, namely DTU, NSIT, and Jamia Millia Islamia, is collected via the use of questionnaires. Answers are provided on a five-point Likert scale. The data we collected on TQM drivers and enablers, when combined, were referred to as essential success factors. These criteria included the Quality of Education (QE), infrastructure, Students and faculty, and Placements [17]

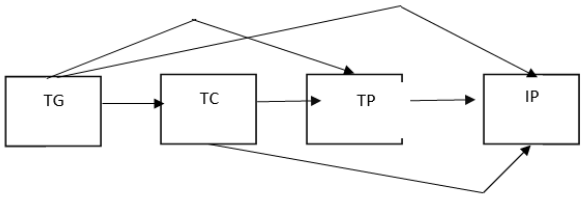


Fig. 2- Relations between TQM Goal (TG), TQM CSFs (TC), TQM Performance (TP) and Institutional Performance (OP).

These three assumptions—the relationship between TC-OP, TP-OP, and TC-TP confounding—are essentially equivalent to controlling for the variables TQM Goal in the Figure, which corresponds to the variables found in the TC-OP, TP-OP, and TC-TP categories, respectively. It's possible that some of the variables will have an effect on all of the TG, TC, and TP, and the covariates themselves could have an impact on one another. There are no issues with any of this, and the covariate groups that are being studied do not need to be differentiated from one another. The fact that the variables that were included in the regression models described above were enough to adjust for TC-OP, TP-OP, and TC-TP confounding is very relevant [18]. For assessing high-dimensional mediation hypotheses, we use a process called Structural Equation Modelling (SEM) to evaluate the links between TQM Critical Success Factors and TQM Performance Variables. To complete this section of the task, the structural equation modelling (SEM) application known as Amos is used

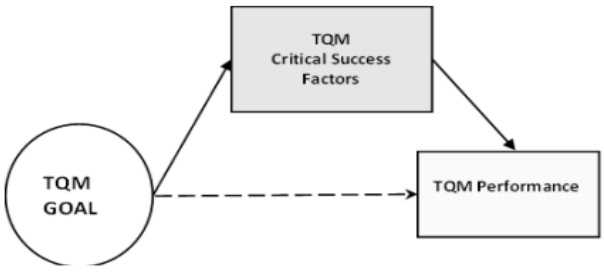


Fig. 3- proposed research model

As we know, organisations have specific goals that they tend to accomplish. Our study aims at defining the CSF (critical success factor) in which we categorize the TQM drivers to main TQM factors (TQM enablers) this helps us to reduce the amount of data Using this method to recognize a domain has led to the development of many specific approaches; however, the majority of these approaches entail much more strict rules on data generation, variabilities, and observability of all relevant information than in typical cases. This is because SEM seeks to understand domains, not just the causal relationships between different variables. With sufficient sample sizes, structural equation modelling (SEM) has the potential to be one of these methodologies since it enables the modelling of behavioural complexity such as model loops, cross-lagged effects, autocorrelation structures, and so on [19]. The versatility of structural equation modelling (SEM) is one of its advantages. This flexibility enables the examination of intricate relationships, the use of various types of data (such as categorical, dimensional, censored, and count variables), and the comparison of multiple alternative models. On the other hand, due to the characteristics of SEM, it is impossible to formulate broad standards regarding the sample size requirements (MacCallum et al., 1999). The success of any system, or more accurately, that of any organisation in achieving its goals, can be determined through performance assessment. Measurement of performance is a process-focused strategy that connects the performance of vital processes to strategic objectives by measuring and improving what is most important to a company. This is accomplished via the use of performance metrics. Establishing dimensions and keeping track of everything are the two most important aspects of measurement. According to Oakland (2003), to obtain accurate measurements of TQM's efficacy, it is necessary to investigate all three aspects of TQM: the human, technical, and commercial aspects. Monitoring the effects of "Total Quality Management" (TQM) may be accomplished by analyzing many aspects of performance with the assistance of crucial success criteria, which are chosen based on the TQM target [20-25]. "Total Quality Management" (TQM) is a dynamic system that may be tamed, as described by Pirsig (1991), and its dynamism is directed and controlled by its key success factors or critical success factors (CSFs), which are assigned as a combination of their drivers and enablers. The drivers and facilitators of "total quality management" differ from one organisation to another, depending on the aim being pursued. The drivers are the constructions that will define not only the performance level of TQM but also the performance level of the company. The empirical drivers, such as education and training, as well as the TQM drivers, were made possible by the enablers. Enablers are in place to help ensure that the system's drivers remain dynamic, allowing for continual development to occur. Since enablers are regarded as variables, it is possible to maintain consistency even when using them.

The elements that were rigorously analysed and shown to be responsible for the system's success in achieving its intended aim are considered crucial success factors of that system. Following an explanation of how the research variables were operationalised and quantified, this section provides a brief description of the sample and an overview of the survey process employed in this study. It was decided that the best way to gather data would be via a survey. Just one step of data collecting was carried out, and that was the questionnaire survey phase.

The study is carried out primarily at two engineering institutions: the Netaji Subhas Institute of Technology and the Delhi Technological University (Delhi Technological University).

Published By:
Blue Eyes Intelligence Engineering
and Sciences Publication (BEIESP)

The final sample contained responses from these and other institutions as well.

Table 1: characteristics of the responding institutes

Institute name	Students participated
Delhi Technological University	152
Netaji Subhash Institute of Technology	60
Jamia millia islamia	25
Others (VIPS, DU colleges, VIT, etc)	13

V. RESULT AND DISCUSSION

Now Let Us Discuss The Model And Check The Reliability Of the model

1) **Reliability of the Model- Cronbach's Alpha Value**

Reliability Statistics

Cronbach's Alpha	N of Items
.896	22

- Essentially, this ensures the internal consistency of the model in terms of how the inter-questionnaires are linked with each other.
- The Cronbach alpha value for our model was 0.896, which is considered an excellent result, indicating that our model is internally reliable.
- To assess the reliability of each TQM driver, we have a table showing the items that were deleted because they did not meet the standards. For this reason, we deleted four drivers from the analysis: I5, O2, Q6, and P4. The results were excellent.

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q1	78.16	87.236	.625	.603	.888
Q2	78.03	88.782	.525	.545	.891
Q3	78.01	88.014	.554	.544	.890
Q4	77.94	87.620	.576	.739	.889
Q5	78.14	87.429	.581	.639	.889
I1	78.04	86.650	.558	.614	.890
I2	78.21	85.794	.612	.827	.888
I3	78.20	88.336	.524	.709	.891
I4	78.41	87.898	.542	.694	.890
I6	78.26	89.121	.524	.509	.891
I7	78.10	88.671	.515	.554	.891
S1	78.14	88.269	.416	.663	.894
S2	77.91	87.268	.497	.657	.892
S3	78.17	90.985	.315	.566	.896
O1	78.07	90.125	.459	.519	.892
O3	77.81	89.400	.436	.636	.893
O4	77.91	88.427	.530	.580	.891
O5	78.01	88.507	.550	.729	.890
O6	78.01	90.681	.377	.634	.894
P1	77.96	88.621	.475	.643	.892
P2	78.30	91.025	.406	.513	.894
P3	77.97	89.419	.467	.533	.892

Fig. 4-Scale & Correlated Table

A. Factor Analysis

For factor analysis, we used SPSS dimension reduction techniques to determine if the CSFs are in a suitable position to demonstrate the reliability of the model and questionnaire results. Process-

1. All the questions were collected, and later, the questions that failed the reliability test were deleted.
2. The rotation type was chosen to be varimax.
3. Scale items were also chosen (original vs if deleted)

Essentially, this represents the proportion of each variable's variance that can be explained by the factors (e.g., the underlying latent variables). It is also noted as h2 and can be defined as the sum of squared factor loadings for the variables.

- The communalities of each question were above 0.5, suggesting that nothing is wrong with the communalities
- Before removing the unwanted questions based on the reliability factor, we obtained the worst result. However, after removing the unwanted questions, we achieved an excellent result, as shown in the table on the left-hand side.
- Now, only this test cannot give the result we want; for that, one needs to check many more parameters. For the adequacy of the model, we used the KMO test.

B. Kmo And Bartlett's Test

- KMO's measure of sampling adequacy is a test performed to assess the appropriateness of accepting factor analysis on the data set available. Additionally, Bartlett's test of sphericity is applied to test the null hypothesis that the different variables in the population correlation matrix are not correlated.
- KMO AND BARTLETT TEST THRESHOLD VALUES - KMO value of over 0.5 and a visible significance level for the Bartlett test below the value of 0.05 suggests there is considerable correlation in the data.
- Now, as far as our data is concerned, it consists of a large number of inputs, and it gives us near-accurate results.

The Kaiser-Meyer-Olkin measurement of sampling adequacy is 0.752 (well above the threshold), and the Bartlett test of sphericity is approximate. = 788.499, ∂f = 231.Based on correlations, it is a very good score.

C. Scree Plot

A scree plot is a line plot that shows the eigenvalues of the factors or main components in an analysis. This kind of graphic is used in multivariate statistics. When conducting an exploratory factor analysis or principal component analysis, the scree plot can be used to determine the optimal number of factors or principal components to retain in the analysis.

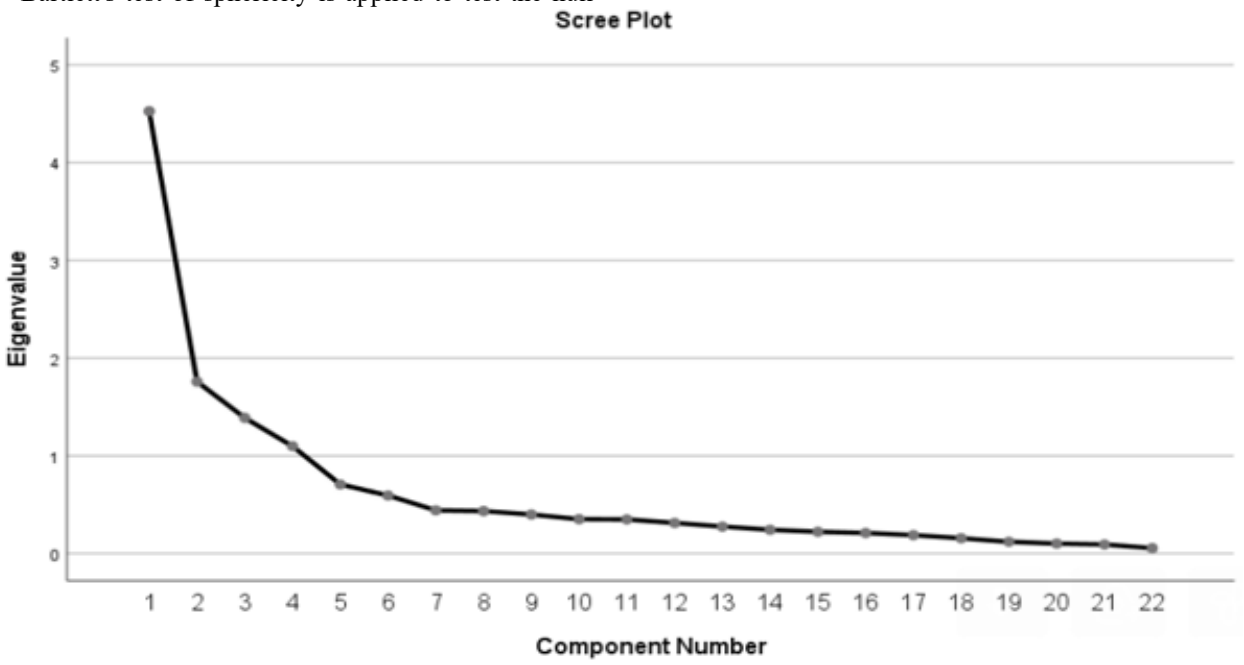


Fig. 5 Scree Plot

The following graph shows the relationship between the Eigenvalue and the number of components; in our example, there are 22 components in the questionnaire. A decent scree plot has a graph with a downward slope and a shape resembling an elbow; this is one of its defining characteristics.

VI. ROTATED COMPONENT MATRIX

You will be able to determine the meaning of the components with the help of the rotated component matrix. The first component has the highest degree of correlation, whereas the succeeding components have a lower degree.

The primary outcome of principal components analysis is the loadings, which are also frequently referred to as the loadings. It includes estimates of the correlations that exist between each variable and the components that have been calculated. We can see that all the capabilities of TQM are interconnected in this image, and this is achieved entirely by SPSS with no interference. This is the case in our particular scenario. This leads us to believe that if we rotate our system or collection of questions, they will remain tightly associated under one head, such as 'I' with all 'I's alone, 'O with 'O's only, and not with any other variable.

Published By:
Blue Eyes Intelligence Engineering
and Sciences Publication (BEIESP)

	Raw Component				
	1	2	3	4	5
I4	.692				
I2	.761				
I3	.600				
I1	.639				
I6	.384				
I7					
O6		.598			
O4		.586			
O5		.552			
O3		.597			
O1		.466			
Q4			.670		
Q5			.526		
Q1			.481		
Q3			.485		
Q2			.432		
S1				.841	
S2				.749	
S3				.665	
P3					.605
P1					.655
P2					.473

Fig. 6- Rotated component matrix

VII. CONFIRMATORY FACTOR ANALYSIS

Once one has a conceptual model, which is a simple sketch on paper with arrows pointing between the variables, showing how influences are predicted, one may proceed to the "testing". CFA is accomplished with SEM. Once you have the conceptual model, you can attain CFA with SEM. And now the person has to deal with the sort of SEM which is appropriate for testing. One further angle from which to examine this problem is to begin with the various modelling approaches. PLS modelling, also known as covariance-based modelling, is one of the options available to us. We would not continue testing or creating models just because EFA indicates specific fundamental structures. Instead, your EFA should first be guided by several dogmatic or theoretical considerations. The meanings of the symbols in this graphic may be found in their respective definitions. The newly formed representations are the functions that provide a generic method for expressing the relationships between the variables included inside the parentheses and those located on the left-hand side of every node.

This is an early model that was fitted using the rotated component matrix from the study, which was created using those data. But, at this point, we are interested in determining whether or not this model is appropriate when it is associated with the TQM enablers (five of them in our instance), i.e. As we are primarily interested in analyzing technical schools, the areas of focus will be on the Quality of Education, Infrastructure, Students and Faculty Information, Other General Aspects, and Placements.

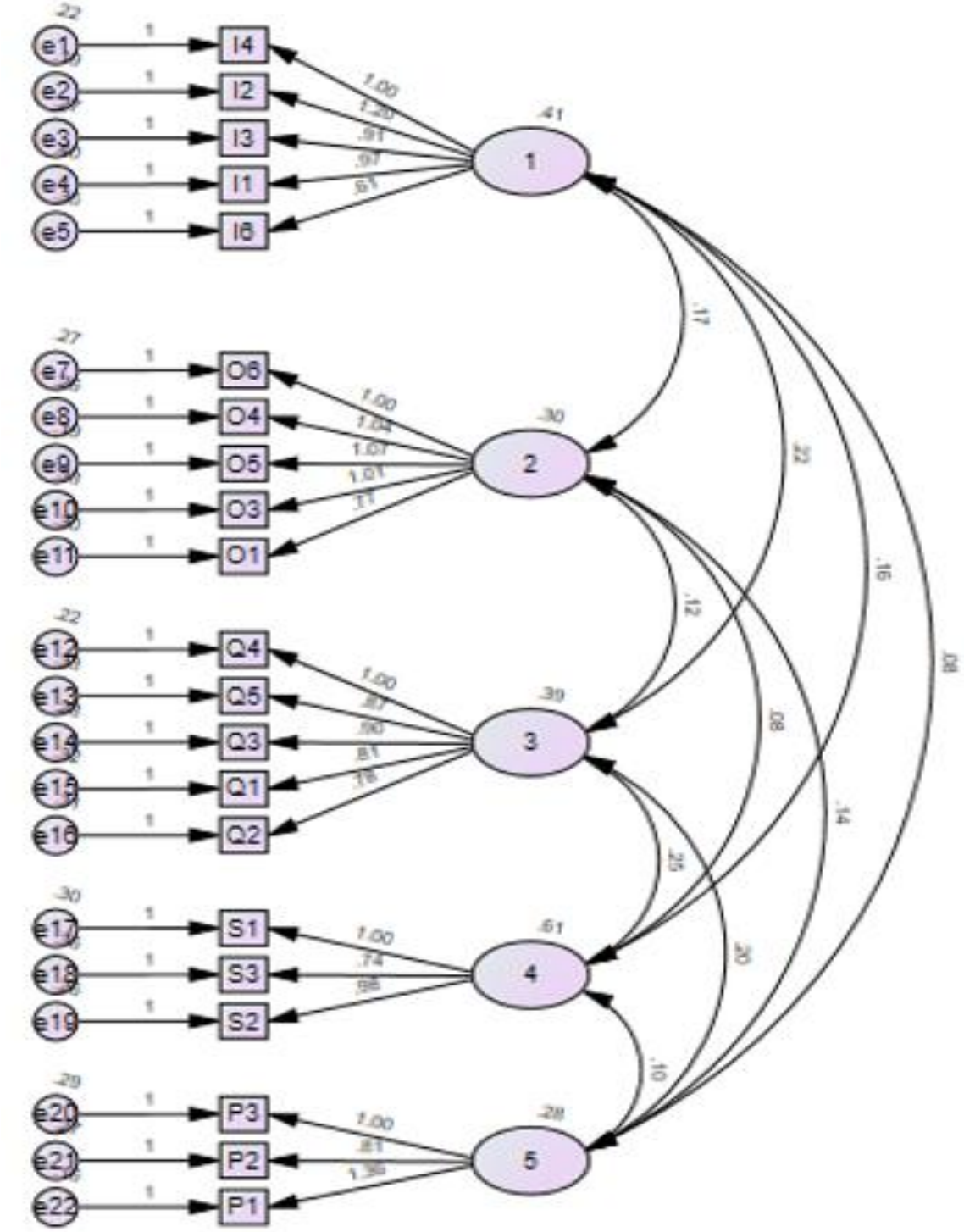


Fig. 7- Confirmatory Factor Analysis

This is an early model that was fitted using the rotated component matrix from the study, created with those data. But, at this point, we are interested in determining whether or not this model is appropriate when it is associated with the TQM enablers (five of them in our instance), i.e. As we are primarily interested in analyzing technical schools, the areas of focus will be on the Quality of Education, Infrastructure, Students and Faculty Information, Other General Aspects, and Placements.

This model establishes a connection between the aforementioned fit model and the many TQMs that fall under the umbrella of the five TQM enablers. I, O, Q, S, and P (numeric) are the different drivers, and they are directly tied to their respective headings. The headings, in turn, are related to the overall performance of the institution or the primary TQM aim, which is related to the numerous TQM enablers (i.e., I, O, Q, S, and P). TQM1, TQM2, TQM3, and so on. Since the majority of our data came from Delhi Technological University, we compared it with that of other reputable universities from around the world that are similarly ranked to our institution.

The table that follows provides a comparison between DTU and other institutes from around the world in terms of teaching and research, which was identified as the most prevalent TQM DRIVER in our analysis. DTU received specific low scores and has considerable room for improvement in both areas. However, the university is making progress in these areas. According to other requirements, it is also making steady progress towards improvement and, in the not-too-distant future, competing on an equal footing with the nation's leading educational institutions.

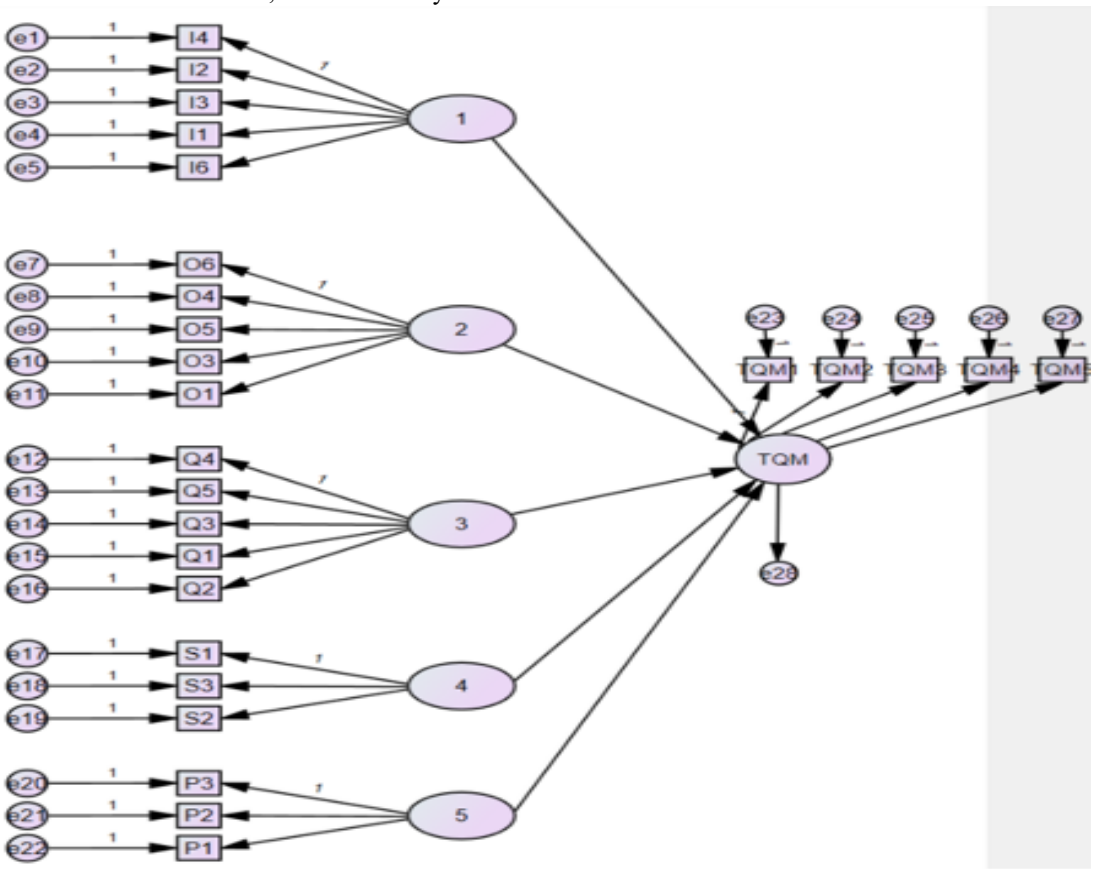


Fig. 8- linkage enablers vs. drivers

Now that we have explained the model and its linkage, it's time to determine whether this model fits the analysis well. For a model to be considered fit, it must meet specific cut-off criteria. Let's see that vs. our scores in front of it

Cutoff Criteria*

Measure	Terrible	Acceptable	Excellent
CMIN/DF	> 5	> 3	> 1
CFI	<0.90	<0.95	>0.95
SRMR	>0.10	>0.08	<0.08
RMSEA	>0.08	>0.06	<0.06
PClose	<0.01	<0.05	>0.05

Fig. 9- cutoff criteria for model fit

Measure	Estimate	Threshold	Interpretation
CMIN	229.138	--	--
DF	179.000	--	--
CMIN/DF	1.280	Between 1 and 3	Excellent
CFI	0.920	>0.95	Acceptable
SRMR	0.084	<0.08	Acceptable
RMSEA	0.064	<0.06	Acceptable
PClose	0.188	>0.05	Excellent

Congratulations, your model fit is excellent!

Fig. 10- our model fit or not

We have found that our hence produce model was fit, and the factors were accordingly placed based on the ratings received through questionnaires.

Table 2 – Influence of individual factor linkage

Estimate the p-value result		linkage
.662 Fail to reject	***	Infrastructure→ tqm1
.573 Fail to reject	***	Quality education→ tqm2
.509 Fail to reject	***	Student faculty info→ tqm3
.475 Fail to reject	***	Important aspects→tqm4
.438 Fail to reject	***	Placements→ tqm5

Retrieval Number: 100.1/ijitee.G95930612723
DOI: 10.35940/ijitee.G9593.0612723
Journal Website: www.ijitee.org

Published By:
Blue Eyes Intelligence Engineering and Sciences Publication (BEIESP)

Fig. 11, 12-Research score and teaching score with near-ranked college

As we have collected data primarily from the Delhi Technological University, we have compared it with the worldwide good universities that possess a similar ranking to our university. Above is the comparison between DTU and other worldwide institutes in terms of teaching & research which is the most prevalent TQM DRIVER in our analysis which got specific low scores and need to be improved but DTU is improving in terms of both as further analysis suggest that delhi technological university has approximately all the teaching staff who are well versed in their PHD and are well qualified in the respective fields also as far as research is concerned many programs are bring run in the university. Further needs are to continuously work towards improving and making it stand head-to-head with top institutes shortly.

VIII. CONCLUSION

Our model of analysis passed all the testing and can be used to examine the quality management of any institution or organisation. Moreover, we found that these factors help in understanding the real-time demand of the students and Attempts can be made to fulfil them. In our effort to determine the success criteria, we found that real-time data collection is essential. The changes in economics, society, culture, and technology all contribute to the development of the knowledge society. If India were to become a superpower in the knowledge sector, it would enable a significant acceleration of the current rate of economic development. In this respect, we have made an effort to examine the data by collecting and analysing it using the software IBM SPSS and AMOS. As a result of these efforts, we discovered that statistical methods are effective for analysing and forecasting the nature of the input provided by the general population. In our study, the primary emphasis was on establishing a connection between quality management and essential success criteria. We also conducted an in-depth examination of the primary elements that, if addressed, could result in a significant improvement for the organisation.

Published By:
Blue Eyes Intelligence Engineering
and Sciences Publication (BEIESP)

The implementation of total quality management within the company enables it to achieve greater levels of productivity and success by focusing on the most effective means of accomplishing its objectives. To conduct a successful study of the students' actions, we relied on reliability factors and model fit analysis. A conceptualised TQM model for achieving excellence in higher education institutions is suggested, and it is dependent on the following characteristics, all of which lead to satisfied students.

DECLARATION

Funding/ Grants/ Financial Support	No, I did not receive it.
Conflicts of Interest/ Competing Interests	No conflicts of interest to the best of our knowledge.
Ethical Approval and Consent to Participate	No, the article does not require ethical approval or consent to participate, as it presents evidence.
Availability of Data and Material/ Data Access Statement	Not relevant.
Authors Contributions	All authors have equal participation in this article.

REFERENCES

1. Pravin kumar (2015) Industrial Engineering and Management, Delhi Technological University.
2. Bollen, K. A. (1989). Structural equations with latent variables. New York: Wiley. [CrossRef]
3. Bolwijn PT, Kumpe T. (1990). Manufacturing in the 1990s—productivity, flexibility, and innovation. Long Range Planning, 23(4), 44–57. [CrossRef]
4. Brotherton, B., & Shaw, J. (1996). Towards an identification and classification of critical success factors in UK hotels Plc. International Journal of Hospitality Management, 15(2), 113-135. [CrossRef]
5. Claver, E., Tari, J.J. and Molina, J.F. (2003), "Critical factors and results of quality management: an empirical study", Total Quality Management and Business Excellence, Vol. 14 No. 1, pp. 91-118. [CrossRef]
6. Demirbag M, Tatoglu E, Tekinkus M, Zaim S. (2006). An analysis of the relationship between TQM implementation and organizational performance: Evidence from Turkish SMEs. Journal of Manufacturing Technology Management, 17(6), Pp. 829–847. [CrossRef]
7. https://economictimes.indiatimes.com/industry/services/education/budget-2023-education-gets-highest-ever-allocation-share-in-gdp-remains-stagnant-at-2-9/articleshow/97534802.cms. *Retrieved 5 March 2023.* {{cite web}}: Missing or empty |title= (help)
8. *"India Literacy Rate". UNICEF. Retrieved 10 October 2013.*
9. *Kumar, Vinay (31 March 2011). "Census 2011: population pegged at 1,210.2 million". The Hindu. Retrieved 9 April 2021.*
10. Jump up to: a b *"World Development Indicators: Participation in education". World Bank. Retrieved 21 August 2014.*
11. *"Education in India". World Bank. Retrieved 9 April 2021.*
12. Jump up to: a b c *"Educational Statistics At a Glance – Government of India" (PDF). education.gov.in. Retrieved 17 March 2021.*
13. *Kingdon, Geeta Gandhi (2 October 2020). "The Private Schooling Phenomenon in India: A Review". The Journal of Development Studies. **56** (10): 1795–1817. doi:10.1080/00220388.2020.1715943. ISSN 0022-0388. S2CID 158006322.* [CrossRef]
14. *Little, Angela W.; Lewin, Keith M. (11 July 2011). "The policies, politics and progress of access to basic education". Journal of Education Policy. **26** (4): 477–482. doi:10.1080/02680939.2011.555004. ISSN 0268-0939. S2CID 145170025.* ^ NSO 2018, pp. 43. [CrossRef]
15. Dixon, J.R., Nanni, A.J., Vollmann, T.E. (1990). The New Performance Challenge: Measuring Operations for World-Class Competition, Homewood, IL: Dow Jones-Irwin.
16. Kumar, V., Choisne, F., Grosbois, D. and Kumar, U. (2009) Impact of TQM on Company's Performance. International Journal of Quality & Reliability Management, 26, 23-37. https://doi.org/10.1108/02656710910924152. [CrossRef]
17. Venkatraman, S. (2007) A Framework for Implementing TQM in Higher Education Programs. Quality Assurance in Education, https://doi.org/10.1108/09684880710723052. [CrossRef]
18. TOTAL QUALITY MANAGEMENT IN HIGHER EDUCATION: A REVIEW Naveen Kumar Research Scholar Department of Commerce, M.D.U, Rohtak, Haryana, India
19. Barros, S., Sampaio, P., and Saraiva, P. (2014). The Relationship between Quality Approaches and their Impact on Portuguese Companies' Quality Performance", International Conference on Industrial Engineering and Operations Management, Bali, Indonesia.
20. Kumar, s.(2009). Total Quality Management. New Delhi: University Science Press. [CrossRef]
21. R.S. Mishra, Rakesh Kumar, Effect of mediation using critical success factors in the TQM for organisational performance evaluation, International Journal of Research in Engineering and Innovation (IJREI), vol 5, issue 6(2021), 387-396. https://doi.org/10.36037/IJREI.2021.5607
22. National Assessment and Accreditation Council (NAAC), 2004. Guidelines for Re-Accreditation, Bangalore: NAAC, Retrieved from: http://uphed.up.nic.in/sNAAC- N.pdf
23. Sangeeta, et al., 2004. Conceptualising total quality management in higher education. The TQM Magazine, 16(2): 145-159. [CrossRef]
24. Srivanci, M.B., 2004. Critical Issues for TQM Implementation in Higher Education The TQM Magazine, 16(6): 382-386 [CrossRef]
25. Wing, C. (1998). Applying Total Quality Management to the Educational Process. Int. J. Engng Ed, 14(1),

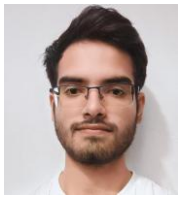
AUTHORS PROFILE

Prof. RS Mishra is a senior professor and ex-HOD in the Department of Mechanical Engineering, Delhi Technological University. He is a well-qualified and experienced individual with a PhD degree. His area of interest primarily includes thermal engineering and related areas such as heat transfer, Alternative Energy sources, RAC, and quality management. He has guided many PhD holders and M.Tech students to complete their degrees. From 1997 to the present, he has dedicated himself to the university, and under his leadership, the department has fulfilled all the requirements of the authority.

Anshuman Pandey is a B.Tech undergraduate in the Department of Mechanical Engineering at Delhi Technological University. He was born on December 10, 2001, and has made significant contributions in design engineering, Total Quality Management, and data analysis. He works on several projects that deal with mechanical design and computer-aided design. He is also involved in futuristic work related to enhancing existing functions and developing new features based on design requirements and constraints. He will be working in the power and design sector shortly.

Aryan Rana is a B.Tech undergraduate in the Department of Mechanical Engineering, Delhi Technological University. His significant contributions are in design engineering, Total Quality Management, and data analysis. He works on several projects that involve computer-aided design. He is also engaged in futuristic work related to enhancing existing functions and developing new features based on the requirements of analysis techniques. He will be working in the consulting sector shortly.

Published By:
Blue Eyes Intelligence Engineering and Sciences Publication (BEIESP)



Aakash Mehta is a B.Tech undergraduate in the Department of Mechanical Engineering, Delhi Technological University. He was born on March 8, 2001, and has made significant contributions to the automobile industry and Total Quality Management. He works on several projects that involve camera-related work. He is also engaged in futuristic work related to enhancing existing functions and developing new features based on design requirements and constraints. He will be working in automobile sector in near future.